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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,552	10/28/2003	Bryce P. Nelson	GENTEL-08436	5469

7590 10/21/2004

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EXAMINER	
LUM, LEON YUN BON	
ART UNIT	**PAPER NUMBER**
1641	

DATE MAILED: 10/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/695,552	NELSON, BRYCE P.	
	Examiner	Art Unit	
	Leon Y Lum	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) *13 and 17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 14-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group 1, claims 1-12 and 14-16, in the reply filed on 30 September 2004, and cancellation of claims 13 and 17 is acknowledged.

Claim Objections

2. Claim 4 is objected to because of the following informalities: The term "groupo" in line 2 of the instant claim seems to be misspelled. Appropriate correction is required.

3. Claims 4-6 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The instant claims further limit the "cellular product" that is recited in Claim 1. However, since the cellular product is in contact with, but not part of, the solid surface of the apparatus, the cellular product is not included in the claimed apparatus. Therefore, the instant claims do not further limit the apparatus and correspondingly, do not further limit the previous claim.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 5-6 and 14-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. In claim 5, line 2, the phrase "cellular mixture" is vague and indefinite. The specification does not define the phrase and it is unclear whether the cellular mixture refers to a combination of two or more of the limitations "whole cell solutions", "lysed cell solutions" or "subcellular compartment solutions", wherein the cellular mixture comprises, for example, a lysed cell solution and subcellular compartment solution, or whether the cellular mixture refers to combinations within each of the said limitations, wherein the cellular mixture comprises, for example, different types of cells within a whole cell solution.

7. In claims 5-6, the term "solutions" is vague and confusing. The specification does not define the term "solutions", but defines phrases that include the instant term. On page 9, line 28 to page 10, line 13, the phrases "whole cell solution", "lysed cell solution", and "subcellular fragment solution" are defined. For example, "whole cell

solution" refers to intact cells and "lysed cell solution" refers to a fractioned cell. However, it is unclear whether the solutions include anything other than whole cells, lysed cells, or subcellular fragments. The Examiner interprets the phrases "whole cell solution", "lysed cell solution", and "subcellular fragment solution" are interpreted as including elements other than whole cells, lysed cells, and subcellular fragments.

8. In claim 14, line 2, the phrase "cellular product" is vague and confusing. The specification states on page 4, 2nd paragraph, that "the present invention is a method to identify molecules that interact with a cell component" and "in such a method, an arrayed surface comprising an array of addressable target molecules is contact with a cellular product." The cellular product is an embodiment in a sample that is to be tested on the system that includes the arrayed solid surface as claimed, and is therefore not part of the system. However, the instant claim includes the cellular product as part of the system. Clarification is required on whether Applicant intends the cellular product to be part of the claimed invention. In addition, Applicant is reminded that it is improper to claim a sample since cellular samples are products of nature and can also differ from one source to another.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-4, 7-8, 10, and 14-15 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kornguth et al (US 5,629,213).

In the instant claims, Kornguth et al reference teaches a system and an apparatus comprising an arrayed solid surface, said solid surface comprising a plurality of addressable target molecules, a cellular product, and said solid surface in contact with said cellular product by disclosing a SPR biosensor system with an ultrathin organic film patterned on an array of islands on a noble metal surface, wherein each island may comprise a slightly different organic film for detection of a single analyte or the detection of multiple analytes (column 2, lines 29-51 and Figures 1-3), wherein the organic film may comprise a protein such as biotin or receptors and nucleic acids, and wherein the organic film is able to detect epitopes on viruses and bacteria (column 2, line 52 to column 3, line 39, especially column 3, lines 3-9 and 33-36; and Figure 3).

With regards to claim 2, Kornguth et al reference teaches that the target molecules are nucleic acids, by teaching that the organic film may be nucleic acids, as stated above (column 3, lines 26-33; and Figure 3). The nucleic acids are attached to the polylysine layer on the array of islands that comprise the biosensor.

With regards to claim 3, Kornguth et al reference teaches that the plurality of target molecules are cell initiation molecules, by disclosing that the organic layer can comprise antigens (column 3, lines 26-33). The specification on page 9, lines 4-6 recite

that cell initiation molecules are proteins. Since antigens are also proteins, Kornguth et al reference provides teaching of antigen proteins as cell initiation molecules.

With regards to claim 4, Kornguth et al reference teaches that the cellular product is whole cell solution, by disclosing that the immunological sensor, the organic film on the biosensor, is able to detect epitopes on bacteria, as stated above (column 3, lines 26-36). Although Kornguth et al reference does not explicitly teach that the viruses and bacteria are in solution, it is necessarily required and well known in the art that the bacteria samples would be provided in solution in order to transfer the samples to the biosensor.

With regards to claims 7-8 and 15, Kornguth et al reference teaches that the solid surface is configured for label free detection, that the solid surface is an SPR surface, and that the system further comprises a detection apparatus, said detection apparatus configured to detect the presence or absence of an interaction between said cellular product and said target molecules, by disclosing that the ultrathin organic film is patterned on a thin noble metal film of the biosensor (column 2, lines 29-40 and Figures 1-3) and that the biosensor is used in a fixed angle SPR system, wherein binding of analytes to the biosensor islands causes a shift in the intensities of the reflected beam in the system relative to islands not bound to the analytes (column 3, lines 9-12), and wherein the SPR biosensor system comprises SPR optical readout components (column 2, lines 37-40).

With regards to claim 10, Kornguth et al reference teaches that the plurality of target molecules comprises at least 2 unique target molecules, by disclosing that each

island may comprise a slightly different organic film, as stated above (column 2, lines 45-48).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kornguth et al (US 5,629,213) in view of Magnani (US 5,965,457).

Kornguth et al reference has been disclosed above and additionally teaches that the organic layer can comprise immunoglobulins as the target molecules (column 3, lines 26-33), but fails to teach that the cellular product comprises a cellular mixture

comprising whole cell solutions, and fails to teach that the cellular product is a whole stem cell solution.

Magnani reference teaches a sample of bone marrow containing a mixture of bone marrow stem cells and T lymphocytes, wherein a purification process using antibodies to CD34 antigen is used to isolate the stem cells, in order to provide a biological source of bone marrow stem cells to repopulate the bone marrow of a cancer patient after ablative treatment (column 1, lines 17-56, especially lines 17-22, 24-27, and 46-52; and column 2, lines 25-29).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Kornguth et al, with a sample of bone marrow containing a mixture of bone marrow stem cells and T lymphocytes, wherein a purification process using antibodies to CD34 antigen is used to isolate the stem cells in the sample, as taught by Magnani, in order to provide a biological source of bone marrow stem cells to repopulate the bone marrow of a cancer patient after ablative treatment. One of ordinary skill in the art at the time of the invention would have reasonable expectation of success in using a sample of bone marrow, as taught by Magnani, in the apparatus of Kornguth et al, since Kornguth et al teach that the biosensor can comprise target molecules that are immunoglobulins to detect the presence of an analyte in a sample, and CD34 markers on stem cells in bone marrow, as taught by Magnani, can specifically bind to immunoglobulins.

14. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kornguth et al (US 5,629,213) in view of Roos et al (US 6,008,893).

Kornguth et al reference has been disclosed above, but fails to teach that the solid surface further comprises a plurality of microfluidics channels.

Roos et al reference discloses a Biacore instrument with an integrated microfluidic cartridge with a series of channels, in order to deliver sample to a sensor chip for either single or multichannel analysis (column 1, line 65 to column 2, line 7), wherein the analysis can be surface plasmon resonance (column 4, lines 26-56, especially lines 26-56, especially lines 26-33 and 44).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Kornguth et al, with an integrated microfluidic cartridge with a series of channels, as taught by Roos et al, in order to deliver sample to a sensor chip for either single or multichannel analysis. One of ordinary skill in the art at the time of the invention would have reasonable expectation of success in including an integrated microfluidic cartridge with a series of channels, as taught by Roos et al, in the apparatus of Kornguth et al, since Kornguth et al teach a biosensor with surfaces capable of SPR detection, and the microfluidic cartridge taught by Roos et al is able to deliver fluid to a biosensor that includes SPR detection methods.

15. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kornguth et al (US 5,629,213) in view of Cantor et al (US 6,007,987).

Kornguth et al reference has been disclosed above, but fails to teach that the plurality of target molecules comprises at least 50 unique target molecules and between 50 and 10000 unique target molecules.

Cantor et al reference discloses an array of 1024 single-stranded probes of a four nucleotide sequence on a hybridization chip, in order to determine the complete sequence of a nucleic acid target (column 7, lines 35-46 and column 19, lines 33-36), wherein detection methods include surface plasmon resonance (column 9, lines 14-18).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Kornguth et al with an array of 1024 single-stranded probes of a four nucleotide sequence on a hybridization chip, in order to determine the complete sequence of a nucleic acid target. One of ordinary skill in the art at the time of the invention would have reasonable expectation of success in using an array of 1024 single-stranded nucleic acid probes, as taught by Cantor et al, in the apparatus of Kornguth et al, since Kornguth et al teach biosensors with nucleic acid probes and detection using surface plasmon resonance, and the 1024 probe array taught by Cantor et al also comprises nucleic acids and can also be detected using surface plasmon resonance.

With regards to the instant claims, it would also have been obvious to one having ordinary skill in the art at the time of the invention was made to apply an array of at least 50 unique target molecules and in the range between 10 and 10000 unique target molecules, in the apparatus of Kornguth et al, since it has been held that where the

general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

16. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kornguth et al (US 5,629,213) in view of Treuter et al (The Journal of Biological Chemistry 274(10), 1999).

Kornguth et al reference has been disclosed above, but fails to teach an instruction manual.

Treuter et al reference discloses an instruction manual, in order to perform SPR analysis on a biosensor (page 6668, right column, 4th full paragraph, lines 1-8).

It would have been obvious to modify the apparatus of Kornguth et al with an instruction manual, as taught by Treuter et al, in order to perform SPR analysis on a biosensor. One of ordinary skill in the art at the time of the invention would have reasonable expectation of success in including an instruction manual, as taught by Treuter et al, with the apparatus of Kornguth et al, since Kornguth et al teach a system with an SPR surface on a biosensor, and the instruction manual taught by Treuter et al contains instructions for using a biosensor for SPR analysis.

In addition, it is well known and common sense to include an instruction manual in a biosensor system in order to instruct a user to use and operate the biosensor system.

Double Patenting

17. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

18. Claims 1-12 and 14-16 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-13 of copending Application Nos. 10/140956 and 10/430586. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the copending applications are only narrower than the claims of the instant application and do not comprise patentably distinct material.

The instant application recites an apparatus comprising an arrayed solid surface, said solid surface comprising a plurality of addressable target molecules. The instant application does not disclose that the plurality of addressable target molecules is an array of transcription factor binding targets.

The copending applications both recite an array of transcription factor binding targets. It would have been obvious to one of ordinary skill in the art at the time of the

invention to modify the instant application with an array of transcription factor binding targets, as taught by the copending applications, since transcription factor binding targets are a type of target molecule. In addition, since the claims in the instant application are directed towards an apparatus, the cellular product as claimed in claims 1 and 14 are do not have a factor in determining the patentably distinctness between the instant and copending applications.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

19. No claims are allowed.

20. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure:

Bogart et al (US 5,468,606) teach a device with immobilized nucleic acid probes on arrays for detecting an analyte using surface plasmon resonance monitoring.

Heller et al (US 5,632,957) teach a system for surface plasmon resonance detection of immobilized biomolecule binding with DNA from lysed cells.

Graham et al (US 6,127,120) teach surface plasmon resonance detection of DNA from lysed cells using an array of oligonucleotide probes.

Bamdad (US 6,306,584 B1) teaches biosensors with arrays of biological species that can bind to cells, and means for surface plasmon resonance detection.

Malmqvist et al (WO 90/05305) teach biosensors with functionalized sensing surfaces for measuring a plurality of biomolecules using surface plasmon resonance.

Bamdad (WO 98/31839) teaches surface plasmon resonance detection for binding between an analyte and biological molecules immobilized on a surface.

Berger et al (Analytical Chemistry, 1998, 70:703-706) teach surface plasmon resonance in a multichannel SPR instrument.

Thiel et al (Analytical Chemistry, 1997, 69:4948-4956) teach detection of DNA hybridization to oligonucleotide arrays using surface plasmon resonance.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Y Lum whose telephone number is (571) 272-2878. The examiner can normally be reached on 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LYL

Leon Y Lum
Patent Examiner
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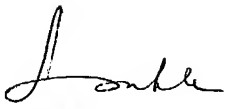

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